June 13, 1939. C. W. HOWARD 2,162,403

PAPER MAKING APPARATUS

Filed Jan. 15, 1937 2 Sheets-Sheet 1

Fig. 1

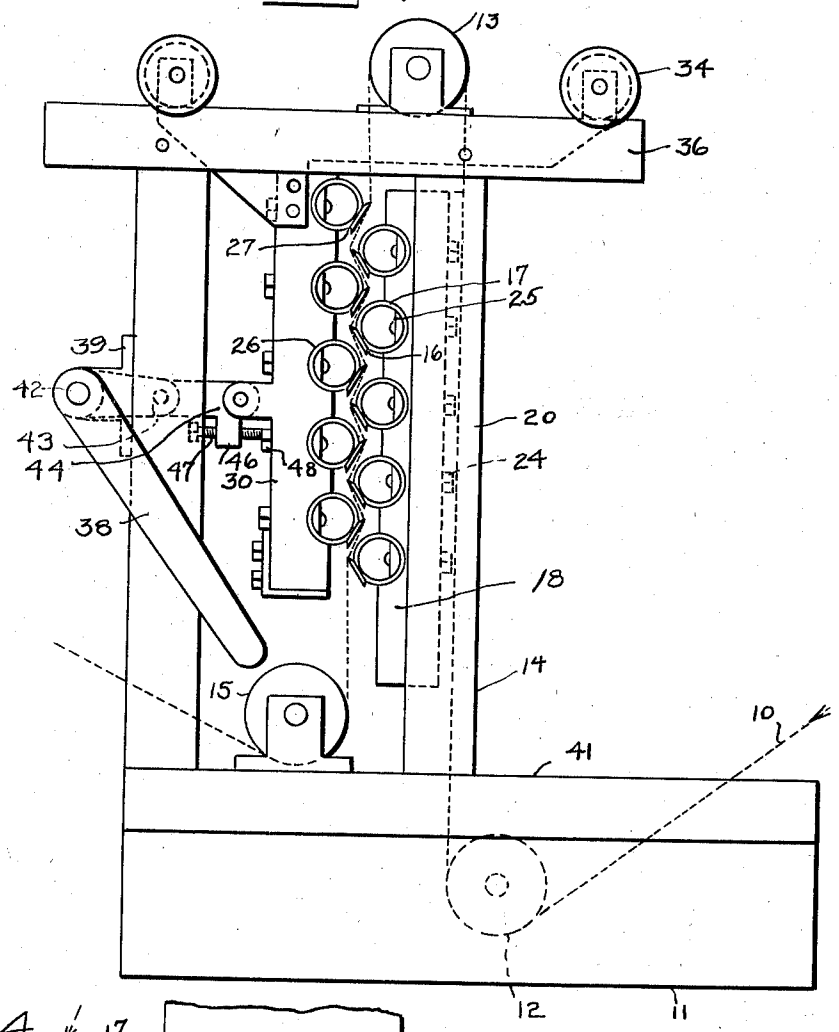
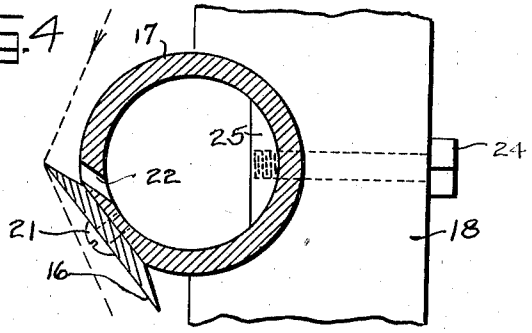


Fig. 4



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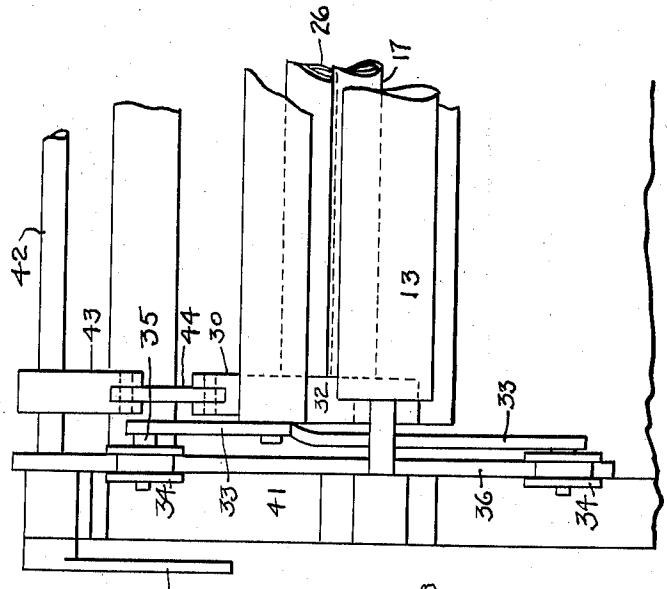


Fig. 2

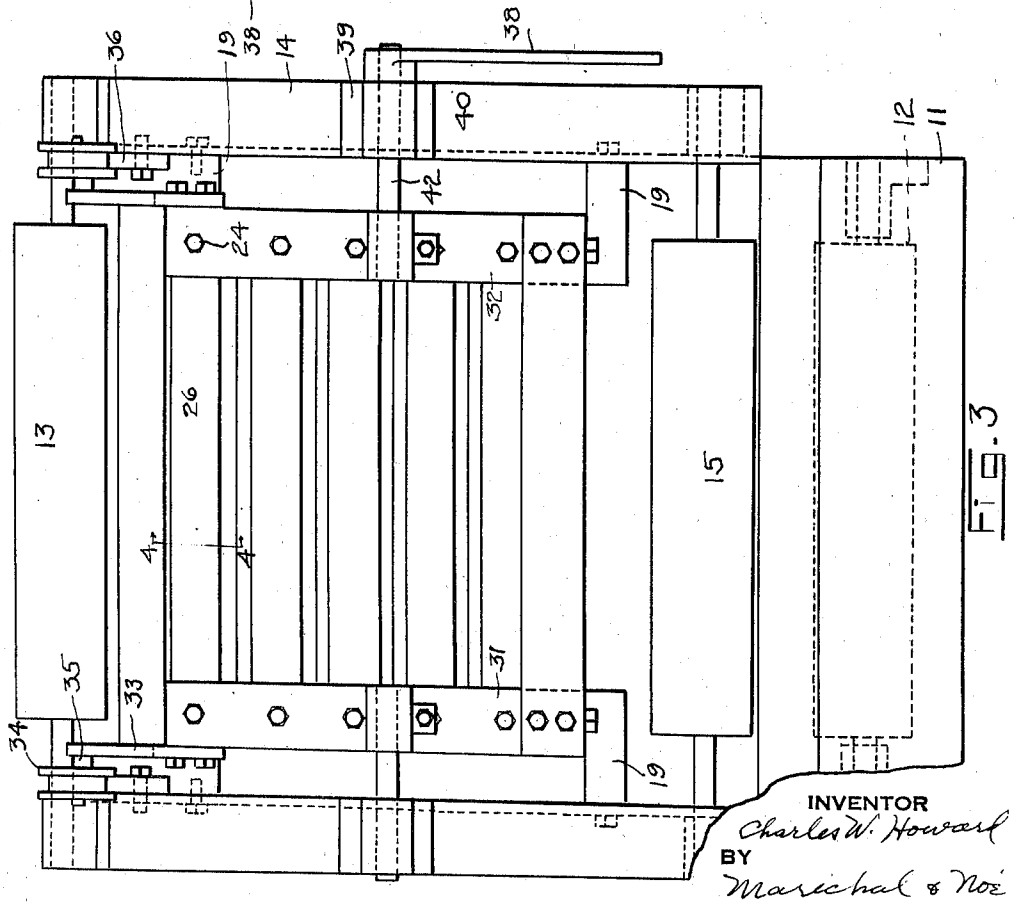


Fig. 3

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PAPER MAKING APPARATUS

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Application January 15, 1937, Serial No. 120,779

4 Claims. (Cl. 15—93)

This invention relates to apparatus employed in the manufacture of waxed paper and the like.

One object of the invention is the provision of an apparatus adapted to remove the cooling water from a web of waxed paper or the like, the water removal being accomplished by a series of scraping or shaving blades carried by supporting means in such a manner as to facilitate rethreading the travelling web of paper in case the paper breaks.

Another object of the invention is the provision of a water removal apparatus in which the travelling web of paper from which the water is to be removed travels past a series of scraping or shaving blades which remove the water from one side of the sheet, a second series of blades, adapted for the removal of the water from the other side of the sheet, being arranged opposite the spaces between the blades of the first series so that the paper moves in a zig-zag path.

Another object of the invention is the provision of a water removal apparatus in which the paper web moves downwardly and is engaged alternately by the scraping blades of the different series for the removal of the water.

Other objects and advantages of the invention will be apparent from the following description, the appended claims, and the accompanying drawings, in which—

Fig. 1 is a side elevation of a water removal apparatus embodying the present invention;

Fig. 2 is a top plan view of the water removal apparatus;

Fig. 3 is an end elevation of the water removal apparatus; and

Fig. 4 is a cross sectional view through one of the scraping blades showing how the tube is held in place, the section being indicated by the line 4—4 on Fig. 3.

Referring more particularly to the drawings by reference numerals, 10 designates a web of paper or the like which has been coated with paraffin or wax. In order to chill the wax before the paper is wound up in a reel, the paper web, immediately after applying the wax to it, is passed into a cold water bath in the tank 11, which hardens the wax. After the paper passes beneath the submerging roll 12, it is guided upwardly over a guide roll 13 which is carried by a supporting frame designated generally by the reference numeral 14. After the paper passes around the guide roll 13, it travels in a generally downward direction and any water which remains on the surface of the waxed sheet is then removed by passing the sheet by a number of shaving or scraping blades which operate successively to scrape off any remaining particles of water so that by the time the paper reaches the lower guide roll 15 it is dry and the paper can then be supplied along the path indicated by dotted lines in Fig. 1 and wound up in a roll. Suction devices that are now commonly used to effect the removal of the water are therefore unnecessary.

In accordance with the present invention the scraping blades are arranged in two series, one of which is adapted to remove the surface water from one side of the paper web while the other series is adapted to remove the water from the other side. Thus there is a series of blades arranged one above the other in spaced relationship on the right side of the web as viewed in Fig. 1, each blade being carried by a supporting tube or the like.

As the paper moves downwardly from the guide roll 13 its right-hand side, as viewed in Fig. 1, is thus engaged by the series of scraping blades 16 each of which extends downwardly and away from the web. These blades each have a sharp scraping edge extending throughout the width of the sheet of paper. Each is carried by a tube 17 which is carried at its end on the upwardly extending header frame 18. The header frame is supported in fixed position by means of brackets 19 on the upwardly extending frame sides 20 of the frame 14.

As shown in Fig. 4, the blade 16 is connected as by means of the attaching screw 21 to the tube 17 so as to project somewhat beyond the vertical plane containing the edge of the tube, and somewhat below the scraping edge of the blade the tube is provided with an elongated slot 22 into which the water scraped off by the blade can run. The water is thus collected in the interior of the tube 17 and may run along the length of the tube and return through the open ends of the tubes into the tank 11.

The tubes 17 may be held by means of supporting bolts 24 threaded into segmental shaped members 25 which fit within the ends of the tubes, the bolts 24 passing through slots in the ends of the tubes to permit some rotational adjustment of the tube positioning.

Arranged opposite the spaces between the several tubes of the series of blades on the right-hand side of the sheet are tubes 26 of a second series of scraping elements including scraping blades 27 which are engageable with the left-hand side of the sheet as viewed in Fig. 1. The edges of the scraping blades 27 are preferably contained in an upright line which is somewhat to the right of the line containing the scraping edges of the blades 16, as indicated in Fig. 1 so that in the normal scraping action the paper travels in a zig-zag path, being engaged first by the blades of one series and then by the blades of an adjacent series, the blades of one series thus serving to hold the paper in engagement with the blades of the other series.

In order to permit ready rethreading of the

sheet in case of breakage of the sheet, the tubes 26 of the scraping blades which engage the left-hand side of the sheet are mounted on a common support or movable header 30, it being understood that the construction of the blades and the tubes themselves are the same in the two series. The support 30 comprises a frame having opposed sides 31 and 32 which carry the ends of the tubes 26, the upper ends of these sides being secured to brackets 33 which are supported by flanged wheels 34. The shafts 35 for these wheels are mounted on the bracket 33 near the ends of these brackets and the wheels operate along tracks 36. These tracks are fixed at the upper ends of the side portions of the main frame, and are sufficiently long so that the movable header support 30 on which the movable tubes are carried can be moved towards and away from the stationary header frame 18. In the position shown in Fig. 1 the movable header frame 30 is in its normal or operative position, but it may be readily moved bodily towards the left from that position so as to widely separate the scraping blades 27 from the blades 16 and thus permit the paper web to be passed from the guide roll 13 vertically down to the lower roll 15. After the paper web is thus rethreaded between the rolls 15 and 13 the movable header or support 30 can be moved so as to bring the scraper blades 27 to their effective scraping positions.

The means for moving the movable header frame 30, as shown, comprises an operating lever 38 pivotally carried by bracket 39 on the frame portion 40, the lower end of which is secured to the main supporting base 41. Fixed to the handle 38 is a shaft 42 which carries a pair of lever arms 43, pivotally connected to the links 44 as shown in Fig. 2. The links are pivoted to the header frame 30 so that when the lever 38 is swung in a counterclockwise direction from its position indicated in Fig. 2 the points of connection between the links 44 and the lever arms 43 will be swung up around the center of the shaft 42, pulling the header frame 30 to the left, the flanged wheels 34 operating along the wheel tacks 36 to maintain the support 30 vertical at all times.

Fixed to the links 44 are arms 46 carrying adjusting screws 47 which bear against stop plates 48, it being understood that adjustment of the screws 47 limits the degree of movement towards the right which is permitted the movable header frame 30. Thus the angular change in the path of travel of the web can be readily adjusted.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. Apparatus of the character described comprising a frame, a series of spaced edged blades carried by said frame and arranged in a series one above the other for engagement with one side of a web of material, means for guiding the web of material past said series, a second series of blades adapted for engagement with the opposite side of the web, a common support for said second series, the edges of said blades pointing toward the oncoming web, and the blades of the second series being arranged opposite the spaces between the blades of the first series and normally providing a zig-zag path for the web, means on said frame for guiding said support for rectilinear movement in a direction transversely of the general line of travel of the web past the blades, a toggle arm pivoted on said frame and a toggle link pivotally interconnecting said toggle arm and said support and adapted to be moved into alignment with the toggle arm to locate the support in a predetermined operative position with the blades of said second series engaged with the web, and means for operating said toggle arm.

2. Apparatus of the character described comprising a frame, a series of tubes fixed in said frame, a blade carried by each of said tubes, said tubes having slots receiving liquid scraped off of a moving web of material by said blades, each blade having an edge pointing generally toward the oncoming web and arranged above the level of its respective slot for the transfer of liquid scraped off from the web along the blade and then into the slot, means for guiding a web of material past said blades with one side thereof in engagement with said blades, a second series of tubes with blades thereon for engagement with the opposite side of the web of material, and means for bodily moving one series of blades with respect to the second series.

3. Apparatus of the character described comprising a frame, a series of horizontally arranged superposed tubes fixed in said frame, a blade detachably connected to each tube and extending outwardly and upwardly therefrom and having an edge adapted for engagement with a moving web of material for the removal of liquid from said web, each tube having a slot arranged below the level of the edge of its respective blade, means for guiding a web of material for downward travel past said blades with one side of the web engaging the blades, a second series of tubes with blades thereon for engagement with the opposite side of the web with the blades of the second series arranged opposite the spaces between the blades of the first series and normally providing a zig-zag path for the web, and means for relatively adjusting the blades of one series with respect to the blades of the other series.

4. Apparatus of the character described comprising a frame, a series of horizontally arranged superposed tubes fixed in said frame, a blade detachably connected to each tube and extending outwardly and upwardly therefrom and having an edge adapted for engagement with a moving web of material for the removal of liquid from said web, each tube having a slot arranged below the level of the edge of its respective blade, means for guiding a web of material past said blades with one side thereof engaging the same, a second series of tubes with blades thereon for engagement with the opposite side of the web, a common support for said second series of tubes means on said frame mounting said common support for rectilinear movement in a direction transversely of the direction of web travel, and toggle means for moving said support to an operative predetermined position when the toggle is straightened and for bodily moving said support to widely separate one series of blades from the other series.

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